

## ABSTRACT

Disclosed is a Spectroscopic Ellipsometer having pseudo-achromatic compensator(s) having fast axes which vary with wavelength and which provide, a range of retardations, (that is, maximum retardance minus minimum retardance), of less than 90 degrees over a range of wavelengths, said range of retardations being bounded by a minimum of preferably at least 30 degrees, to a maximum of less than 135 degrees. Calibration is achieved by a Mathematical Regression based technique involving, where desirable, Parameterization of Calibration Parameters. Various Dimensional Data Set(s) obtained with the Spectroscopic Ellipsometer configured in a Sample, present" or in a Straight-through" configuration, are variously normalized to D.C., A.C. or combination D.C. and A.C. components. Sample analysis using a detector provided intensity signal simultaneously comprising  $2\omega$  and  $4\omega$  signals simultaneously, and use of un-normalized A.C. and/or D.C. signals in reflectance monitoring are also disclosed.